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## **Neurotypical interventions: A neurodiverse approach to school-based social communication support**

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Harriet Axbey is an ESRC funded student working within a neurodiversity paradigm to produce a resource for classrooms which focuses on developing effective social interactions.

ESRC Funded PhD Project

## **Neurotypical interventions: A neurodiverse approach to school-based social communication support**

Working within a neurodiversity paradigm, this project will investigate potential differences in how autistic and neurotypical (NT) children interact with each other (A-A and NT-NT), and between-groups (A-NT). It will also consider whether autistic and NT individuals perceive these social interactions differently. Interactions will be coded while children recount a social scenario story, and jointly complete a spaghetti tower task along a diffusion chain. A diffusion chain design will be used as it allows cumulative effects of transmission, which are not always apparent in dyadic settings, to be examined. Ten NT and ten autistic adults will code the interactions to see if there are differences in how they are perceived depending on the autistic diagnosis. Autistic and NT children within the interactions will also be asked about their experiences of the interaction to examine synergies and differences from alternative perspectives. The information from these studies will inform the production of a resource for use in the classroom to support the social and emotional development of autistic and NT children. This resource will help autistic children develop an understanding of NT children's thoughts and behaviours, and assist NT children in their understanding of these in autistic children.

Keywords: autism; neurodiversity; education; teaching

### **Background**

An appreciation of others' feelings, knowledge and point of view is crucial to successful classroom-based teaching and learning. Autism spectrum disorder (hereafter 'autism' and 'autistic' as per Kenny et al., 2015) is often characterised by a difficulty in understanding such mental states in others (Pillai et al., 2014). However, recent research suggests that neurotypical (NT) individuals lack an understanding of the mental states of autistic people (Sasson et al., 2017). Such a lack of understanding has far-reaching implications for the delivery of support for autistic pupils. The planned research will investigate how autistic and non-autistic people perceive each other's thoughts and actions, with an ultimate aim to develop effective and evidence-based classroom support.

### **Context**

It is a legal requirement that every child in the UK has access to an education. However, 17% of autistic children are excluded from their schools, 47% of whom are excluded three or more times across their time in compulsory education (Reid & Ayris, 2011). This is a worrying figure, as it has been shown that school exclusions, aside from depriving children of an education, are associated with poor levels of mental health in young people (Ford et al., 2017). Autistic children are also much more at risk of experiencing bullying than their neurotypical peers (Chen & Schwartz, 2012). Some theorists believe that autistic individuals are lacking basic social abilities that allow them to integrate within the school community, leading to disagreements and exclusions (Baron-Cohen, 2008; Bogdashina, 2005). The capacity to infer others' beliefs, emotions and intentions is referred to as a 'Theory of Mind' (ToM). Baron-Cohen (2008) described autistic individuals as having 'mind-blindness'; a lack of a ToM. However, it may be that, rather than having a simple deficit in ToM, autistic individuals have lower social motivation, leading to problems with social anxiety (Chevallier, Kohls, Troiani, Brodtkin & Schultz, 2012; Dubey, Ropar & Hamilton, 2017). Furthermore, counter to the deficit model of autism, autistic individuals have shown strengths in increased divergent thinking for creative purposes (Liu, Shih & Ma, 2011), and spatial abstract reasoning (Stevenson & Gernsbacher 2017).

There is a growing opinion in the scientific and business communities that autism is 'just a different way of thinking', and has many positive implications (Wille & Sajous-Brady, 2018). The author's planned research will build on this concept by testing it experimentally, and addressing the potential misconception that autistic children are 'mind-blind', and instead perceive situations differently and have different social priorities to their neurotypical (NT) peers. The findings will be used to develop classroom support resources to improve the social and emotional development of autistic and NT children. The author hopes to produce a clear guide to neurodiversity in the classroom, such as that provided by Wille and Sajous-Brady (2018), who present a succinct and clear approach to encouraging neurodiversity in the workplace, suggesting clear solutions to barriers often faced by autistic individuals; this shows that neurodiversity is catching on across sectors as people embrace the idea that different ways of thinking can be beneficial.

The author also aims to establish whether children who are NT require support developing a ‘theory of autistic minds’ (or autistic theory of mind, ATOM) in order to create inclusive, neurodiverse classrooms. Sasson et al. (2017) found that NT individuals show reluctance in engaging in social interactions with autistic peers. This can lead to negative effects for autistic individuals as they have fewer opportunities to create relationships and develop their social skills. Sasson et al. (2017, p.8) recommended creating interventions and education-based approaches that targeted both autistic pupils as well as their typically developing peers as this would “*offer a more comprehensive approach for improving social and functional outcomes in autism*”.

The research will work under the paradigm of neurodiversity with the aim of helping autistic children to have a better school experience, through providing tools to help them understand other people’s feelings and behaviour, and vice versa.

## **Methods**

Ethical approval will be obtained from Durham University’s School of Education Ethics Committee and informed consent will be collected from all participants and their parent or guardian (for under 18s).

Study one will investigate whether and, if so, how autistic and NT children describe a social scenario differently to a peer. Social scenario stories heavy in mental state narrative will be presented to autistic and NT children. Using a diffusion-chain technique, an initial child would be told a story by a researcher, the child would then repeat the story to another child, and this would be repeated down a chain of six participants. This procedure would be repeated with autistic (A-A-A), non-autistic (NT-NT-NT) and mixed chains (A-NT-A-NT), and for two different stories where the protagonist is autistic or NT. The author will recruit four groups of six children for each condition, therefore N=72 (A=36 and NT=36). Due to the difficulty in recruiting an autistic sample, autistic children (aged 8-12 years) will be recruited first, then an equal number of NT children will be recruited (matched by age).

Diffusion chains accumulate effects, therefore there may be interaction styles seen with this method that are too subtle to be seen in one-to-one settings. These interactions will be videoed and the resulting narratives coded, e.g., mental state terms used, structure and coherence, as well as the

interaction styles, both between pairs of children in the chain and across the chains. The narratives and interaction styles for autistic and NT children will then be compared, as a whole and also when describing an autistic or NT protagonist's behaviour. This will establish whether autistic or NT children differ in their style of interaction and information transmitted based on their own characteristics and the characteristics of their partner and the story protagonist; and if they do differ, how they differ.

A second empirical study will look at a non-verbal collaborative task - spaghetti-tower building (Caldwell and Millan 2008) - to establish if similar dynamics of interaction across autistic, NT and mixed pairs occur within other domains (a novel, construction task that is not out of place in a primary school classroom). Pairs of children within the diffusion chains (NT-A, A-A and NT-NT, as in the previous study) will be asked to build a tower as tall as they can using dry spaghetti and play dough. The interactions will be coded in terms of the interaction styles and height of the towers. Again, this between-group trend-test analysis along with the changes will establish whether autistic and NT children differ in their style of interaction and task success based on their own characteristics and the characteristics of their partner and, if so, how they differ.

The videoed interactions in S1 and S2 will be coded by ten autistic and ten NT adult coders to gain an understanding of how a researcher's coding might be affected by their neurotypicality. The coders will be 'blind' to whether the children are NT or autistic and will be asked to code the interactions for, among many factors, their perceptions of fluidity, coherence, enjoyability, success and the participants' empathy, and engagement. This will allow the development of an understanding of the perceptions of NT and autistic people about interactions of NT and autistic people, rather than relying on the coding of only NT coders.

A design process will take place for the third study, to translate the results of S1, S2, and S3 into a tool to be used to help autistic children develop their theory of the non-autistic mind, and NT children develop a theory of autistic minds (ATOM). Data will be collected via three workshops in which the results from S1, S2, and S3 will be presented to professionals, researchers, and autistic and NT students. These groups will then be encouraged to reflect on the data in the light of their

experiences to establish suitable interventions to improve the interactions of NT and autistic children in classroom interactions.

The final study will evaluate acceptability, feasibility and potential efficacy of the design from study three by running it in classrooms with autistic and non-autistic pupils so as to gauge its usefulness and practicality. The study will be conducted in small groups ( $n \leq 8$ ) as well as whole class environments ( $n=30$ ). Pre- and post-intervention data regarding ToM/ATOM skills and peer dynamics will be collected through ethnographic methods including observations and diaries completed by the researcher and the class teachers. This will allow the researcher to judge the effectiveness of the intervention, as well as record how the tool is being used.

The project's plans are quite ambitious and have some risks regarding potential unmet recruitment goals of autistic individuals, however, the author has mitigated against these. The difficult recruitment goals are achievable with support from the author's supervisory team, who have excellent connections in the autistic community.

## **Impact**

This study will provide evidence directly applicable to the neurodiversity movement and the social model of disability (Woods, 2017). It is hoped that in future, easily accessible and clearly stated pieces like Wille and Sajous-Brady's (2018) advice on embracing neurodiversity in the workplace, will be available to schools in a relevant educational format. The findings from this project will be disseminated through research papers in high quality journals. In addition, there will be a final resource aimed to improve social and emotional development in NT and autistic children; this will be shared freely online through national and international networks.

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